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ABSTRACT This prospective study evaluated the association of self-reported health habits and behaviors in 2,930 Navy recruits with poor training outcomes, defined as graduating late or separating from training. Although 17% of the men and 21% of the women had a poor training outcome, results suggest that some self-reported measures were associated with poor training outcomes. Men who did not run or jog at least 1 month before basic training or had a previous lower limb injury without complete recovery and women reporting the same or less physical activity compared with their same-age counterparts were more likely to have a poor training outcome. An important first step in decreasing poor training outcomes is encouraging incoming recruits to participate in physical activity and taking steps to identify and rehabilitate recruits who are not completely healed from a lower limb musculoskeletal injury before reporting to basic training.

INTRODUCTION

All U.S. Navy enlisted sailors are required to graduate from 7 weeks of basic training at the Naval Recruit Training Command (RTC), Great Lakes, Illinois, before assignment to specialized schools. RTC is the sole entry-level training command for the U.S. Navy and trains male (30,000 per year) and female (8,000 per year) Navy recruits. Candidates must meet minimum physical standards to qualify for enlistment to ensure that the Navy enlists only those applicants who are capable of successfully completing basic training[1] (http://www.cnrc.navy.mil/publications/1130.8J.htm).

Some recruits can take longer than 7 weeks to complete basic training if they are required to repeat a training cycle before eventually graduating. U.S. Navy recruits who do not graduate on time negatively impact the Fleet Marine Force by slowing down the time it takes for a recruit to matriculate into the Fleet Marine Force (accession pipeline). Poor training outcomes (failing to graduate or graduating late) increase the recruiting and basic training costs, and negatively affect military operational readiness[2] (http://handle.dtic.mil/100.2/ADA460104). There is evidence of an association between the risk of musculoskeletal injury during basic training and baseline level of health and fitness before basic training, and that injury accounts for increased medical costs, a higher first-term active duty attrition rate, and poor long-term military outcomes.[3–8]

The purpose of this study is to identify Navy recruits who are likely to have a poor training outcome by examining self-reported measures before training. Identification of simple self-reported measures to predict poor training outcomes could lead to cost-effective screening and interventions. These results could also benefit other U.S. military services and nonmilitary populations who participate in a required physical training program to improve job performance.

METHODS

Participants

Subjects were male and female RTC basic trainees. There were 3,272 Navy recruits briefed about the study, and 2,956 (90%) consented to participate. We excluded 22 subjects who had prior service or were enlisted trainees from another service branch and 4 who were lost to follow-up. The final sample for univariate analyses included 2,312 men and 618 women and for multivariate analysis 2,297 men and 617 women (Table I).

Study Design

This prospective study enrolled subjects from January to April 2007. All participants received the Privacy Act statement and signed a consent form in accordance with the guidelines of the Naval Health Research Center Institutional Review Board (Protocol NHRC.2007.0025) before completing the baseline questionnaire. The baseline questionnaire included factors decided by a multiservice panel of Army, Air Force, Navy, and Marine Corps investigators for a study with the purpose of identifying and reducing injuries and attrition in basic training across the services.[9,10] The Bureau of Naval Personnel approved the trainee survey (BUPERS Navy Survey Approval RCS 1513-1).

To avoid sampling error, male recruits who were identified as being in the Naval Special Warfare Preparatory School pilot program, who were integrated into standard training divisions,

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TABLE I. Sample Size of U.S. Navy Recruits, Great Lakes, Illinois, 2008

Status	Total	Men	Women
Approached	3,272	2,564	708
Consented (%)	2,956 (90)	2,333 (91)	623 (88)
Prior Service or Other Branch	22	17	5
Lost to Follow-up	4	4	0
Sample for Univariate Analyses	2,930	2,312	618
Sample for Multivariate Analysis	2,914	2,297	617
Graduated on Time (%)[a]	2,399 (82)	1,913 (83)	486 (79)
Graduated Late or Separated (%)[b]	531 (18)	399 (17)	132 (21)

[a]Positive outcome. [b]Negative outcome.

were not approached to volunteer for this study because their training takes longer and incorporates additional physical requirements (they would all take longer than 7 weeks to graduate, and they would be mistakenly considered to have had a poor training outcome).

Outcome Variables

This prospective study enrolled subjects before officially starting recruit training, and graduation status was determined at the end of training. Recruits were divided into 2 groups based on their graduation status: those who graduated late or were separated from training (poor training outcome) and those who graduated on time. Graduation dates were collected and on-time graduation was determined from RTC administrative records.

Exposure Variables

Shortly after arrival at RTC, a few days before training commenced, incoming recruits were briefed on the nature and purpose of the study. Consenting recruits were administered a baseline questionnaire, 1 time only, that asked about tobacco use, physical activity, injury history, and (for women) menstrual history; uniformed personnel and the authors were not present.

The questionnaire asked about the recruit's smoking status, self-rated fitness, physical activity level, prior injuries sustained, and menstrual history. A current smoker was a recruit who had smoked during the past 30 days. The reference group for current smoker status was those who reported not having smoked cigarettes in the past 30 days.

Self-rated fitness was divided into 3 categories: excellent/very good (reference group), good, and fair/poor. Several physical activity questions assessed exercise or sports participation and running behavior, including average frequency (per week) during the previous 2 months and length of time (months) before recruit training. For all exercise and sports questions, the group with the highest level of activity was the reference group.

History of previous lower limb injury was used as a categorical variable with 3 levels: those with a previous lower limb injury that had not completely healed, those with a previous lower limb injury that had healed, and, the reference group, those without a history of previous lower limb injury.

Women answered 5 additional questions based on menses during the 12 months before basic training. From these questions, several variables were created: primary amenorrhea (women whose age at menarche was ≥16 years), menstrual regularity (≥10 menses in the past 12 months as the reference group), secondary amenorrhea (≥6 consecutively missed menses during the past 12 months), birth-control hormone use (No as the reference group), and months since last pregnancy.

Additional exposure data collected from RTC administrative records included age, height, weight, and race/ethnicity. Age was used as a categorical variable (<19, 19–23, >23 years), with those aged 19 to 23 as the reference group. Height and weight were measured by the medical clinic staff 1 or 2 days after recruits had completed the questionnaire. Body mass index (BMI) was derived from weight (kg) and height (m) as weight/height^2. BMI was categorized using Centers for Disease Control and Prevention guidelines: low (≤18.4), normal (18.5–24.9), and high (≥25), with normal BMI as the reference group. Race categories were White/Caucasian alone (the reference group), Black/African American, Asian, and other (some other race or 2 or more races).

A number of studies support use of recruits' initial physical fitness run time as strong determinant of basic training success.[7,11–15] RTC administrative records provided recruits' initial physical fitness test run times; however, this variable was excluded as a covariate because the initial run test was administered during the third week of training and does not represent the recruits' incoming fitness level. The physical activity, injury history, and physical fitness questions were designed to provide information about the recruits' baseline fitness in the absence of the recruits' initial run time and to determine factors associated with poor training outcomes by administering a simple questionnaire before sending the recruit to RTC.

Statistical Analyses

SPSS statistical software, version 17.0.2 (SPSS, Chicago, Illinois) was used to analyze the prospectively collected data. Univariate analyses, t tests for continuous variables and χ^2 tests for categorical variables, and unadjusted odds ratios (ORs) examined the association between poor training outcomes and each potential risk factor by sex. For multivariate analysis, the measure of association was the adjusted OR, which was generated from a multiple logistic regression analysis. The backward elimination logistic regression procedure began with all the exposure variables and removed each factor that was not statistically significant, reassessing the model after the removal of each factor.[16] In all cases, statistical significance was determined by a p value less than 0.05. Separate logistic regression models were run for men and women with respect to poor training outcomes, adjusting for age and race.

RESULTS

Approximately 17% of the men and 21% of the women graduated late or failed to graduate (Table I). Mean (±SD) age was 21.4 (3.1) years for men and 21.4 (3.3) years for women. Among the men, the mean (±SD) height, weight, and BMI were 68.6 (2.8) inches, 173.7 (30.4) pounds, and 25.9 (4.0), respectively; 77.6% were self-identified as White/Caucasian, 16.5% as Black/African American, 3.8% as Asian, and 2.1% reported being some other race or 2 or more races. Among the women, the mean (±SD) height, weight, and BMI were 63.6 (2.7) inches, 143.4 (24.1) pounds, and 24.9 (3.6), respectively; 64.9% were self-identified as White/Caucasian, 26.1% as Black/African American, 6.0% as Asian, and 3.0% reported being some other race or 2 or more races. Forty-two percent of men and 46% of women were in the normal BMI range (18.5–24.9). Age, height, weight, BMI, and race did not vary by graduation status for either men or women; however, there was a weak association with increased poor graduation outcomes among female recruits in the low-BMI category (n = 16 represents only 2.8% of the population studied) (OR = 3.06; 95% confidence interval [CI]: 1.00–9.36). Thirty-six percent of the men and 29% of the women reported having smoked in the previous 30 days. Smoking status was not associated with poor training outcomes in either men or women.

Unadjusted logistic regression models were used to calculate crude ORs and 95% CIs with respect to poor training outcomes (Tables II and III). Both male and female recruits who self-rated being somewhat or much less active than their same-age counterparts were less likely to graduate on time than those who reported being much or somewhat more active: men (OR = 1.33; 95% CI: 1.02–1.73) and women (OR = 2.83; 95% CI: 1.66–4.81). In addition to female recruits who self-rated being less physically active than their same-sex counterparts, those who reported having about the same activity level were more likely to have a poor training outcome compared with those who reported being much or somewhat more active (OR = 2.18; 95% CI: 1.25–3.78).

Male recruits who self-rated their current physical fitness as fair or poor (OR = 1.35; 95% CI: 1.00–1.82), their exercise or sports physical activity participation ≤1 time/week in the past 2 months (OR = 1.46; 95% CI: 1.05–2.02), or ≤1 month of running or jogging in the past 2 months (OR = 1.47; 95% CI: 1.05–2.05) were more likely to have a poor training outcome compared with the group with the highest level of activity. Male recruits who reported previous lower limb

TABLE II. Association of Demographics, Physical Characteristics, and Menstrual History Questionnaire Item Responses With Poor Training Outcomes by Sex; U.S. Navy Recruits, Great Lakes, Illinois, 2008

		Men			Women		
		Poor Training Outcome			Poor Training Outcome		
Graduation Status	Category	n^a	%[a]	OR (95% CI)[a]	n^a	%[a]	OR (95% CI)[a]
Age (Years)	<19	430	19.5	1.23 (0.94–1.63)	151	23.2	1.10 (0.70–1.73)
	19–23	1,520	16.4	1.0	358	21.5	1.0
	>23	362	18.2	1.14 (0.84–1.54)	109	18.3	0.82 (0.48–1.42)
BMI (kg/m^2)	≤18.4	29	10.3	0.71 (0.21–2.36)	16	31.3	3.06 (1.00–9.36)
	18.5–24.9	896	14.1	1.0	255	12.9	1.0
	≥25.0	1,233	13.2	0.93 (0.73–1.20)	290	17.6	1.44 (0.89–2.31)
Race/Ethnicity							
White/Caucasian		1,793	16.7	1.0	401	19.3	1.0
Black/African American		381	21.0	1.32 (0.99–1.74)	161	25.5	1.43 (0.93–2.20)
Asian		89	18.0	1.09 (0.63–1.90)	37	21.6	1.15 (0.51–2.62)
Other[b]		49	20.4	1.28 (0.63–2.59)	19	21.4	1.93 (0.71–5.23)
Questionnaire Items							
Age at Menarche (Years)[c]	<16			n/a[d]	581	21.5	1.0
	≥16				33	18.2	0.81 (0.33, 2.01)
Menstrual Cycles in Past Year[e]	≥10			n/a[d]	508	21.3	1.0
	1–9				64	25	1.24 (0.69–2.26)
	None				9	11.1	0.46 (0.06, 3.74)
Months Since Last Pregnant (per 6 Months)[f]				n/a[d]	97	23	1.04 (0.94–1.14)
Gone ≥6 Months Without Menstrual Cycle in Past 12 Months[e]	No			n/a[e]	513	22	1.0
	Yes or Never had a Period				83	20.5	0.91 (0.51–1.62)
Used Birth Control in Past 12 Months	No			n/a[e]	400	19.7	1.0
	Yes				215	24.7	1.33 (0.90–1.98)

OR, unadjusted odds ratio. [a]n is the number of subjects in the category; % is the poor training outcome incidence. [b]American Indian, Alaska Native, Native Hawaiian, Pacific Islander; some other race; 2 or more races; not reported. [c]Primary amenorrhea: women whose age at menarche was ≥16 years. [d]Not applicable. [e]Women who reported being pregnant during the 12 months before training (n = 18) were excluded from the analysis. [f]Ever pregnant, including those participants pregnant within 12 months of basic training.

TABLE III. Association of Smoking, Prior Physical Activity, and Injury With Poor Training Outcomes by Sex; U.S. Navy Recruits, Great Lakes, Illinois, 2008

		Men			Women		
	Graduation Status		Poor Training Outcome			Poor Training Outcome	
Questionnaire Item	Response Category	n^a	%[a]	OR (95% CI)[a]	n^a	%[a]	OR (95% CI)[a]
Current Smoker[b]	No	1,470	17.2	1.0	436	22.9	1.0
	Yes	824	17.6	1.03 (0.82–1.29)	179	17.3	0.70 (0.45, 1.10)
Self-Rating of Physical	Much More Active/Somewhat More Active	1,113	16.4	1.0	184	12.0	1.0
Activity Compared	About the Same	669	15.8	0.96 (0.74–1.24)	206	22.8	2.18 (1.25–3.78)
With Same Age and Sex	Somewhat Less Active/Much Less Active	530	20.8	1.33 (1.02–1.73)	227	27.8	2.83 (1.66–4.81)
Self-Rating of Current	Excellent or Very Good	455	16.0	1.0	40	15.0	1.0
Physical Fitness	Good	963	14.8	0.91 (0.67–1.24)	232	15.1	1.01 (0.39–2.57)
	Fair or Poor	889	20.5	1.35 (1.00–1.82)	345	26.4	2.03 (0.83–5.00)
Frequency of Exercise or	5 Through ≥7 Times/Week	558	16.3	1.0	89	24.7	1.0
Sports 2 Months Before	2–4 Times/Week	1,346	16.1	0.99 (0.76–1.29)	356	19.7	0.75 (0.43–1.29)
Basic Training	Never, <1, or 1 Time/Week	407	22.1	1.46 (1.05–2.02)	172	23.3	0.92 (0.51–1.68)
Frequency of Running or	5 Through ≥7 Times/Week	308	20.1	1.0	55	18.2	1.0
Jogging 2 Months Before	2–4 Times/Week	1,258	15.6	0.73 (0.53–1.01)	323	17.6	0.96 (0.46–2.03)
Basic Training	Never, <1, or 1 Time/Week	743	18.8	0.92 (0.66–1.29)	240	27.1	1.67 (0.80–3.51)
Length of Time (Months)	7 Months Through ≥1 Year	386	14.5	1.0	79	15.2	1.0
Ran or Jogged Before	4–6 Months	416	14.9	1.03 (0.70–1.53)	93	22.6	1.62 (0.74–3.57)
Basic Training	2–3 Months	727	17.1	1.21 (0.86–1.71)	183	20.2	1.42 (0.69–2.89)
	Did not Run or Jog or ≤1 Month	777	19.9	1.47 (1.05–2.05)	262	23.7	1.73 (0.88–3.41)
Ever Had a Lower	No	1,877	17.5	1.0	531	21.8	1.0
Limb Injury	Yes	426	16.5	0.91 (0.69–1.21)	87	18.4	0.81 (0.45–1.44)
Did Any Lower Limb Injury	Never Been Injured	1,848	17.6	1.0	516	21.9	1.0
Prevent You From Doing	No	157	13.4	0.72 (0.45–1.16)	37	24.3	1.15 (0.53–2.50)
Normal Physical Activity	Yes	294	17.0	0.96 (0.69–1.33)	65	21.4	0.65 (0.32–1.31)
≥1 Week							
Previous Lower Limb	No Injury	1,866	17.5	1.0	523	100.0	1.0
Injury, Recovery	Complete Recovery	415	14.9	0.83 (0.62–1.11)	94	18.1	0.79 (0.45–1.39)
	Incomplete Recovery	16	56.3	6.05 (2.24–16.37)	1	21.8	Not Calculable

[a]*n*, number of subjects in the category; %, recruits with a poor training outcome in the category. [b]Smoked during the past 30 days.

injury with incomplete recovery were 6 times more likely to have a poor training outcome compared with those who reported never injuring a lower limb (OR = 6.05; 95% CI: 2.24–16.37).

The factors displayed in Tables II and III were candidates for the final multivariate model of independent factors for poor training outcomes (Table IV). The strongest predictors of poor training outcome using baseline information from the self-reported questionnaire were different for men and women. Men who reported running or jogging ≤1 month before basic training were 76% more likely to have a poor training outcome compared with those who reported running or jogging 7 months to 1 year before basic training, and men who had a previous lower limb injury with incomplete recovery were over 7 times more likely to have a poor training outcome compared with those who reported never having had a lower limb injury. Men who reported a previous injury with complete recovery were no different in

TABLE IV. Independent Factors for Poor Training Outcomes by Sex; U.S. Navy Recruits, Great Lakes, Illinois, 2008

		Men		Women	
Factor	Response Category	AOR (95% CI)[a]	p^a	AOR (95% CI)[a]	p^a
Length of Time (Months) Ran	7 Months Through ≥1 Year	1.0	<0.01		
or Jogged Before Basic Training	4–6 Months	1.07 (0.67–1.70)			
	2–3 Months	1.22 (0.81–1.84)			
	Did not Run or Jog or ≤1 Month	1.76 (1.19–2.61)			
Previous Lower Limb Injury, Recovery	No Injury	1.0	<0.01		
	Complete Recovery	0.83 (0.59–1.17)			
	Incomplete Recovery	7.33 (2.61–20.60)			
Self-Rating of Physical Activity Compared	Much More Active/Somewhat More Active			1.0	<0.01
With Same Age and Sex	About the Same			2.50 (1.26–4.91)	
	Somewhat Less Active/Much Less Active			3.05 (1.57–5.93)	

[a]AOR, adjusted odds ratio, adjusted for all variables in the table plus age and race; overall *p* value determined from Wald χ^2.

poor training outcome from those who reported no injury. Women who reported being less active than their same-age counterparts were 3.1 times more likely to have a poor training outcome compared with those who reported being more active than their same-age counterparts. Similarly, women who reported the same activity level as their same-age counterparts were 2.5 times more likely to have a poor training outcome compared with those who reported being more active than their same-age counterparts.

DISCUSSION

The basic training attrition literature identifies factors associated with basic training discharge or factors associated with basic training success. This study demonstrated that a brief questionnaire could identify factors associated with poor training outcomes (delayed graduation or separation) in Navy recruits. Previous attrition research identified extrinsic and intrinsic risk factors for injury because injury is a strong determinant of graduating from basic training.[11,12,17–19] Prospective studies that identified injuries that occur during basic training as an independent factor for graduating are consistent with the present study.[11–14,18,20,21]

Risk factors for discharge from basic training include low aerobic fitness,[11–13,22] low physical activity level before basic training,[11–13,18] low muscular endurance,[11,18] and cigarette smoking before training.[11,18] Studies conducted among female athletes[23–25] and female Marine Corps recruits[14,26] have suggested that a history of menstrual dysfunction may be a common risk factor for stress fracture and musculoskeletal injuries, which could lead to discharge from basic training. Our baseline questionnaire addressed these potential risk factors.

Two prospective studies assessed factors associated with discharge in the Air Force[27] and Marine Corps[15] by analyzing self-reported and medical clinic data using multiple logistic regression to determine their independent effects and relative importance. The Air Force study developed models for 4 categories of discharge: medical, psychiatric/behavioral, legal, and performance related. Less incoming physical activity was an independent factor in all 4 categories of discharge.[27] Smoking (current smoker, ex-smoker, never smoked) was an independent factor only in the legal discharge category.[27] We found that male recruits reporting less physical activity, specifically those who reported running or jogging ≤1 month before basic training, were more likely to have a poor training outcome. The study of Marine Corps recruits also developed a multiple logistic regression model to evaluate independent factors for discharge.[15] Recruits older than 23 years, poor incoming self-reported physical fitness, no history of competitive sports participation, and a lower limb injury before basic training without complete recovery were independent factors associated with discharge.[15] In contrast, we found that self-reported current fitness level and sports participation were not independent factors for poor training outcomes in either men or women. However, in agreement with the Marine Corps study, we found that male recruits reporting incomplete recovery of a previous lower limb injury were more likely to have a poor training outcome, and there was no increase in poor training outcome for those who reported a previous injury with complete recovery for either men or women. The distinguishing factor was complete or incomplete recovery.

An Army study looked for predictors of training success, defined as graduating from basic training.[28] Trainees completed a baseline survey self-reporting previous injuries that limited participation in organized sports; quantified the frequency and duration of running, aerobic exercise, and weight training in the 6 months before basic training; and whether they smoked. Results of the recruits' initial physical fitness test were obtained from the training companies. The univariate predictors of training success were the recruit's performance on the initial physical fitness test and history of cigarette smoking; multivariate models were not analyzed.[28] We found that smoking status was not an independent factor for poor training outcomes in either men or women.

Factors suggested to impact poor training outcomes in women include primary and secondary amenorrhea, irregular menstrual activity (oligomenorrhea), and birth control use.[5,9,14,23,24,26,29–31] Female recruits in our study answered questions based on menses during the 12 months before basic training, primary amenorrhea (age at menarche ≥16 years), irregular menstrual activity (<10 menses), secondary amenorrhea (≥6 consecutively missed menses), and birth-control hormone use. We found that self-reported menstrual history was not associated with poor training outcomes.

There are several limitations of our study. We relied on self-reported physical activity, which Adams et al[32] has shown to be influenced by social desirability bias. Social desirability is the defensive tendency to portray oneself in keeping with perceived cultural norms, in this case a military environment, and could result in over reporting positive responses. It is also possible the questionnaire lacks construct validity and does not accurately assess information; in general, the respondent could have misinterpreted a question or deliberately given misleading answers. However, to improve construct validity, the questionnaire was developed through evidence-based consensus of subject matter experts from the Air Force, Army, and Navy, and to improve comprehension of the questionnaire, each question was read aloud to provide clarity by a study investigator without uniformed personnel present. Volunteers were also encouraged to ask questions to clarify their understanding of a question, hopefully minimizing this bias.

A history of alcohol consumption might have an influence on poor training outcomes. Alcohol consumption questions were not asked because more recruits might have declined to enroll in the study or after enrolling in the study and seeing alcohol questions might intentionally provide misinformation. Survey questions about alcohol consumption might be misinterpreted by the recruit as disclosing a practice that

could lead to legal separation because the minimum age to consume alcohol is 21years for all Navy personnel and most of the incoming recruits are too young to legally drink alcohol[33] (http://doni.daps.dla.mil/allinstructions.aspx). Other potential factors for poor training outcomes include diet, nutritional status, and psychological factors. It is possible that these factors could increase the predictive ability by accounting for more recruits with poor training outcomes, but these factors were not addressed in the questionnaire.

Literature suggests basic training graduation rates vary by season,[34] specifically the rate of poor training outcomes is higher during the summer months. Our study enrolled subjects from January to April 2007 and does not represent the annual enrollment at RTC Great Lakes, Illinois. If the current study enrollment occurred during the summer months, more recruits may graduate late (a poor training outcome) and seasonal conditions might become a confounding factor.

This study has several strengths. The questionnaire is simple and easy to administer with respect to time and recruit comprehension. Most of the basic training attrition literature discusses logistic regression models with injury or stress fracture as an exposure variable. Gathering medical information requires time-consuming data collection methods, such as medical record screenings, or medical evaluations and separate recordkeeping methods to document an event that occurs while basic training is already under way. The simple baseline questionnaire can be administered at the recruiting office, before sending the recruit to RTC, as a screening tool and could be effective in reducing basic training attrition. The questionnaire was developed through evidence-based consensus of subject matter experts from the Air Force, Army, and Navy and perhaps could be used by all the services as a universal screening tool. The study sample size is large, and has good statistical power, and uses multivariate analysis to better separate data, which adds clarity to the issues involved with basic training attrition.

In summary, the results of the current study suggest that some simple self-reported measures can be strong independent factors associated with poor training outcomes in both men and women. The male model consists of 2 objective modifiable factors, whereas the sole factor in the female model consists of a subjective comparison of her individual physical activity level compared to others of her same age. Men who did not run or jog at least 1 month before basic training or who had a previous lower limb injury without complete recovery were more likely to have a poor training outcome. In contrast, the sole independent factor for women was a subjective report of the same or less physical activity compared with her same-age counterpart. In conclusion, an important first step in decreasing poor training outcomes is encouraging incoming recruits to participate in physical activity before arrival and taking steps to identify and rehabilitate recruits who are not completely healed from a lower limb musculoskeletal injury before reporting to basic training.

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14. ABSTRACT

This prospective study evaluated the association of self-reported health habits and behaviors in 2,930 Navy recruits with poor training outcomes, defined as graduating late or separating from training. While 17% of the men and 21% of the women had a poor training outcome, results suggest that some self-reported measures were associated with poor training outcomes. Men who did not run or jog at least 1 month before basic training or had a previous lower limb injury without complete recovery, and women reporting the same or less physical activity compared with their same-age counterparts were more likely to have a poor training outcome. An important first step in decreasing poor training outcomes is encouraging incoming recruits to participate in physical activity, and taking steps to identify and rehabilitate recruits who are not completely healed from a lower limb musculoskeletal injury before reporting to basic training.

15. SUBJECT TERMS
risk factor survey, U.S. Navy recruit, injury, physical fitness, epidemiology

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